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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,593	02/26/2004	Masanobu Takeuchi	SNY-052	4361
20374	7590	08/04/2006	EXAMINER	
KUBOVCIK & KUBOVCIK SUITE 710 900 17TH STREET NW WASHINGTON, DC 20006			PARSONS, THOMAS H	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 08/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/786,593

Applicant(s)

TAKEUCHI ET AL.

Examiner

Thomas H. Parsons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

***Response to Amendment***

This is in response to the Amendment filed 20 June 2006.

***(Previous) DETAILED ACTION***

***Specification***

1. The objection to the disclosure because of minor informalities has been **withdrawn** in view of Applicants' Amendment.

***Claim Rejections - 35 USC § 103***

2. The rejections of claims 1-12 under 35 U.S.C. 103(a) as being unpatentable over JP10-223220 in view of Vaccaro et al. (5,738,907) have been **withdrawn** in view of Applicants' Amendment.

***Response to Arguments***

3. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

***(NEW) Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-223220 in view of Vaccaro et al. (5,738,907), as evidenced by Onodera et al. (5,506,016).

**Claim 1:** JP10-223220 in Drawing 1 discloses a nonaqueous electrolyte secondary battery comprising a positive electrode (2) and a negative electrode (1) capable of occluding and releasing lithium and a nonaqueous electrolyte (3)(paragraph [0019]), wherein the negative electrode comprises silicon as an active material (paragraphs [0010]-[0032]). More particularly, JP10-223220 in paragraphs [0011] and [0012] disclose a negative electrode active material such as an alloy of lithium and silicon into which a binder may be added. Further, JP10-223220 in paragraph [0031] discloses fabricating the active material into a sheet and heat-treating at 200°C under reduced pressure. The Examiner has construed the heat treatment as sintering.

JP10-223220 discloses as a binder, thermoplastic polymers such as polyethylene, polypropylene, and cellulose.

Accordingly, JP10-223220 discloses a sintered negative electrode comprising a silicon active material and a binder. Onodera et al. are cited as evidence to only show that these thermoplastic polymers are heat resistant binders (col. 10: 14-34).

JP10-223220 does not disclose a foamed metal containing the above active material with binder therein.

Vaccaro et al. disclose a foamed metal containing an active material therein for a nonaqueous electrolyte secondary battery (abs., col. 1: 7-11, col. 3: 5-8 and 21-23, col. 5: 17-22, col. 8: 59-63, col. 1: 51-col. 2: 30, and col. 9: 17-19 and 33-63). Vaccaro et al. disclose that the foams are processed to be conductive wherein the process includes a heating step for curing or drying (col. 5: 45-61). The Examiner has construed this heating step as a sintering step. Vaccaro

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et al. also disclose that heating can be handled at a temperature range of between about 250°F to 500°F (121°C to 250°C)(col. 7: 20-23).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the electrode of JP10-223220 by incorporating the foamed metal of Vaccaro et al. because both are concerned with a negative electrode sheet comprising active material, and Vaccaro et al. teach a foamed metal containing an active material therein that would have provided an electrode with enhanced strength and more desirable electrical and mechanical properties thereby improving the overall structural integrity and performance of the battery.

Further, combining the sintered negative electrode of JP10-223220 comprising active material with a binder with the sintered foam metal of Vaccaro et al. would obviously lead one skilled in the art to the claimed sintered product.

**Claim 2:** The rejection is set forth above in claim 1 wherein further Vaccaro et al. disclose foamed metal comprising copper or nickel (col. 5: 23-33).

**Claims 3 and 4:** The rejection of claims 3 and 4 are as set forth above in claims 1 and 2, respectively, wherein further JP10-223220 discloses a slurry comprising silicon particles and a binder (paragraphs [0031] and [0021]) and Vaccaro et al. disclose a foamed metal containing an active material therein (col. 9: 51-56).

The recitation **prepared by impregnation or coating** has been considered and construed as a process limitation that adds no additional structure to the electrode. However, Vaccaro et al. disclose impregnation or coating a foamed metal with an active material (col. 5: 23-44).

**Claims 5-8:** The rejections of claim 5-8 are as set forth above in claims 1-4, respectively, wherein further JP10-223220 in Drawing 1 discloses a negative electrode comprising the foamed metal (1) and a metal current collector (6), and the foamed metal is adjacent to a side of the metal current collector (paragraphs [0031]-[0032]).

**Claims 9-12:** The rejections of claim 9-12 are as set forth above in claim 5-8, respectively, wherein further JP10-223220 in Drawing 1 discloses a foamed metal and the metal current collector secured together by structural pressure of the battery (paragraphs [0031]-[0032]).

**Claim 13:** The rejection of claim 13 is as set forth above in claim 1 wherein further JP10-223220 discloses a polymer thermoplastic such as polyethylene, polypropylene, and cellulose which are known heat resistant binders as evidenced by Onodera et al. The polymer thermoplastic binder of JP10-223220 has been broadly construed as encompassing other heat resistant binders such as a polyimide, also evidenced by Onodera et al.

Therefore, it would have been within the skill of one having ordinary skill in the art at the time the invention was made to have substituted a polyimide resin for the polymer thermoplastics of JP10-223220 as both are functionally equivalent as evidenced by Onodera et al.

**Claim 14:** The recitation “wherein the foamed metal containing the active material and the binder are sintered at a temperature in the range of 250 ~ 600°C” has been construed as a process limitation that adds no additional structure to the claimed invention.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H. Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
PATRICK JOSEPH RYAN  
SUPERVISORY PATENT EXAMINER

Thomas H Parsons  
Examiner  
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